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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,770	01/03/2007	Erwin Bayer	011235.57497US	3336

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EXAMINER

KATZ, VERA

ART UNIT	PAPER NUMBER
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1784

MAIL DATE	DELIVERY MODE
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04/30/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/572,770	Applicant(s) BAYER ET AL.	
	Examiner Vera Katz	Art Unit 1784	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-39 is/are pending in the application.
- 4a) Of the above claim(s) 31-37 and 39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-30 and 38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/21/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Invention I claims 20-30 and 38 in the reply filed on 03/16/10 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 31-37 and 39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected subject matter, there being no allowable generic or linking claim.

Specification

2. The substitute specification filed 03/21/06 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because a marked-up copy of the substitute specification has not been received (in addition to the clean copy). MPEP 714 (B).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 20-30 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 20 and 30 recite narrower and broader ranges in the same claims thereby do not clearly set forth the metes and bounds of the

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protection desired; see MPEP 2173.05(c). For example, Claim 20 recites “wear protection coating, in particular, erosion protection coating” Claim 30: “a component, in particular, a gas turbine component” ; “wear protection coating, in particular, with an erosion protection coating”.

4. Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 recites “damping properties” and it is unclear what the applicant means, since the claim does not specify what is meant to be damped. For compact prosecution this limitation is regarded to be satisfied if other limitations of the instant claims have been met.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 20-28, 30 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Schaeffer (5783315).

Considering claims 20-21, 23-24, 28, 30 and 38, Schaeffer teaches a gas turbine component; [Fig.1], or a coating resistant to environmental damage for gas turbine engine and therefore, considered to be wear protection or erosion protection coating; [col. 1, lines 37-39 and col. 2, lines 42-46]. However, regarding the recitation “wear protection coating, in particular, erosion protection coating for gas turbine component” , this recitation has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Thus the surface 31 of the substrate 32 the coating is applied to, is considered to-be protected surface of a mechanically stressed component, the recitations above are intended use limitations and are not deemed to further limit the subject matter of the claims. Schaeffer further teaches a double layer structure 30 wherein the first layer 36 is applied directly to the surface 31 and a second layer 38 applied directly to the first layer 36 forms an outer cover coat; [Fig. 2B]. The first layer comprises the same or similar components as that of the substrate, and therefore is considered to be adapted to a material

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composition of the component; [col. 4, lines 1-30]. However, little patentable weight has been given to the claim language "adapted to" as no limiting effect is required in the claims, see MPEP 2111.04.

Considering claims 22, 25-26 and 27, the substrate, or the component is a titanium alloy or titanium aluminum alloy, such as titanium aluminide; [col. 2, lines 42-44]. The first layer is titanium alloy, or titanium aluminum alloy; [col. 4, lines 22-30]. The component is a gas turbine blade 20; [Fig. 1]. The first layer is applied by plasma spray that provides porosity in the layer. Schaeffer also teaches that by varying chromium content in the first layer the density and the hardness of the layer can be decreased; [col. 4, line 55-58 and col. 5, lines 5-6]. The second layer is a ceramic layer and is considered to be relatively hard. However, the terms "relatively soft" and "relatively hard" of claims 21 and 27, respectively, are not considered further limiting the claims, as these terms are not defined in the instant specification.

6. Claims 20-30 and 38 are rejected under 35 U.S.C. 102 (a) and (e) as being anticipated by Bruce (20060018760). Considering claims 20-21, 23-24, 28, 30 and 38, Bruce teaches a gas turbine component such as a blade; [Figs.2-4], or a coating with improved impact and erosion resistance for gas turbine engine; [title, 0028]. The coating 62 is applied to a surface of a component 60. The coating 62 is formed from at least one metal layer and one ceramic layer; [0039,0040]. The ceramic layer is the second or the outermost layer, while the metal layer is the first layer; [0040]. The first layer is directly

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applied to the component and the second layer is directly applied to the first layer; [0040]. The metal layer comprises materials similar to those of the first layer.

Considering claims 22 and 25-26 and 29, the component comprises titanium aluminum alloy, such as Ti6-4 (Ti-6Al-4V); [0035]. The second layer is titanium aluminum nitride or titanium aluminum chromium nitride as representing an only group of nitrides; [0041, 0037]. Bruce further teaches that it is desirable for metal layer to comprise the same metal atoms as those in the ceramic, or second layer; [0039], and further shows that the metal, or the first layer is titanium aluminum alloy; [0038]. The ceramic coating is hard and the hardness is based on the ceramic layer and erosion resistance is proportional to the hardness; [0042]. Metal layer is ductile or soft; [0005]. As it was shown above, the structure of the component, the materials of the component, the first and the second layers are identical to those of the instant claims. The method of fabrication of the metal layer of the reference article, a PVD method (physical vapor deposition) is identical to that of the instant application; [0041]. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. (MPEP 2112.02). Therefore, based upon the similarities of the materials, and the method of making the product, the porosity of the first layer is expected to also be commensurate with the claims.

7. Claims 20-25, 27-30 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Gibbs (EP0289173).

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Considering claims 20, 23-24, 28, 30 and 38, Gibbs teaches a wear-resistant component, such as turbine blade; [title, p. 3, line 43]. The component comprises a substrate made of titanium alloy, a first layer, immediately adjusted to the substrate comprising titanium and the surface layer, or the outer second layer on the first layer; [claim 3, p. 2, lines 16-18 and 53].

Considering claims 22 and 25, the hardness of TiN decreases when the first layer of Ti is added, and therefore, the first layer is considered to be relatively soft; [p. 4, Tables]. Also, the titanium metal is softer than titanium nitride ceramic. As it was shown above, the structure of the component, the materials of the component, the first and the second layers are identical to those of the instant claims. The method of fabrication of the metal layer of the reference article, a PVD method (physical vapor deposition) is identical to that of the instant application; [p. 3, lines 3-4]. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. (MPEP 2112.02). Therefore, based upon the similarities of the materials, and the method of making the product, the porosity of the first layer is expected to also be commensurate with the claims.

Considering claims 27 and 29, the second layer is hard titanium nitride; [p. 2, lines 8, 16-20 and p. 4, line 43].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schaeffer (5783315) as applied to claim 20 above in view of GB 2170226. As it was shown above, Schaeffer teaches all the limitations of claim 20, but does not teach a second layer comprised of titanium nitride. GB2170226 teaches a wear-resistant coatings of high hardness comprising TiN; [abstract]. It would have been obvious to one of ordinary skill in the art to provide a turbine component with a structure as taught by Schaeffer, wherein the outer, second layer is replaced by titanium nitride of GB 2170226, because Schaeffer invention is focusing on improvement of the wear resistance and GB2170226 titanium nitride coating is the best known coating for wear protection; [GB2170226, p. 1, lines 16-18].

9. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schaeffer (5783315) as applied to claim 20 above in view of Mroczkowski (4094542). As it was shown above, Schaeffer teaches all the limitations of claim 20, but is silent about a second layer comprised of titanium nitride. Mroczkowski teaches a hard wear-resistant layer for a turbine comprising titanium nitride; [col. 3, line 10]. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a turbine component with a structure as taught by Schaeffer, wherein the outer, second layer is replaced by titanium nitride of Mroczkowski, because this modification would

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provide a wear protection due to particle impact over a very wide range of angles of incidence; [col. 3, lines 24-26].

10. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbs (EP0289173) in view of (4094542). As it was shown above, Gibbs teaches all the features of claim 20, also teaches a titanium alloy and aluminum in the component; [p. 2, line 53], but lacks aluminum in the first titanium layer. Grunke teaches alloying titanium with aluminum to prevent titanium to become brittle. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a turbine component with a structure and a titanium first layer, as taught by Gibbs with an aluminum addition to titanium of the first layer because the Gibbs concern is brittleness of the coatings; [p. 4, line 49, p. 2, lines 12-15] and Grunke aluminum addition to titanium would decrease brittleness of the coating or a substrate due to delayed entry of oxygen into the component; [Grunke, col. 1, lines 30-35].

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, see attached form PTO-892.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Katz whose telephone number is (571)270-7082. The examiner can normally be reached on M - Th 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JENNIFER McNEIL can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vera Katz/
Examiner, Art Unit 1784

/John J. Zimmerman/
Primary Examiner, Art Unit 1784